

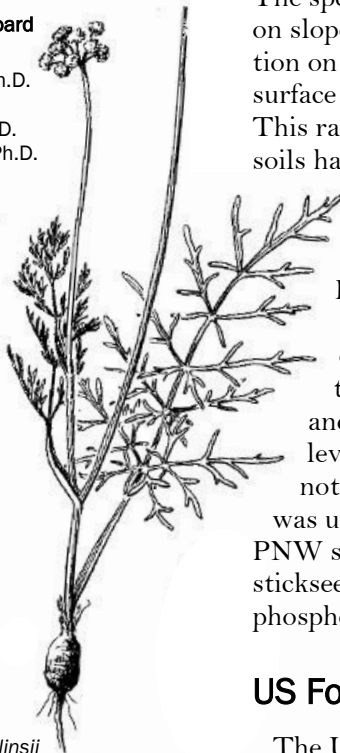


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*Lomatium rollinsii*

## Showy stickseed exploits environments with low competition

Rare Care, along with faculty and graduate students at the University of Washington's School of Environmental and Forest Sciences, wrapped up a multi-year study of the federally-endangered showy stickseed (*Hackelia venusta*). The study was funded by the US Fish and Wildlife Service to support recovery efforts for the species by developing a better understanding of its habitat requirements and by improving propagation techniques.

One focus of the study was to characterize the physical and chemical properties of the soils at the site of the only known population. The soils appear to be quite different than other soils in the area. The species grows on a loose granitic sand on slopes exceeding 30 degrees. Vegetation on these soils is quite sparse, and the surface soils are actively sliding downhill. This raised the question as to whether the soils have a unique chemical composition that facilitates showy stickseed's survival.

Soil studies were completed by Betsy Vance for her Master's thesis. She found that the soils had low organic content, nitrogen levels typical of Pacific Northwest forests, and high extractable phosphorus levels. Notably, she determined that nothing in the soil chemistry profile was uniquely different from typical PNW soils that would explain showy stickseeds preference for the site. The high phosphorus levels (continued on page 2)

## Pygmy saxifrage found

In each new monitoring season, we're delighted by a few unexpected discoveries. This year, these finds include a single pygmy saxifrage (*Saxifraga hyperborea*) high up near a rocky mountain summit.

This occurrence was documented in 1979 when "an occasional lone plant" was noted. Rare Care volunteers searched diligently for this occurrence from 2010-2013. After three unsuccessful attempts, we removed it from our monitoring list in order to focus on other rare plant occurrences.

So why did our volunteers find it this year? They were searching for something else! A US Forest Service botanist asked us to monitor Tisch's saxifrage (*Saxifraga tischii*) at the same site. Two volunteers who had searched that summit previously for *S. hyperborea* accepted the *S. tischii* assignment; they were familiar with the area. They found five Tisch's saxifrage plants. (continued on page 4)

## US Forest Service recognizes Rare Care for citizen stewardship

The US Forest Service awarded Rare Care its Regional Volunteer Award for Citizen Stewardship & Partnerships, thanks to hundreds of Rare Care volunteers from Washington and Oregon who have visited approximately 1,000 rare plant populations on federal, state, and other public lands over the past 14 years,

In her nomination, District Botanist Lauri Malmquist wrote, "As staffing and funding to the Botany/Ecology Program on the Okanogan-Wenatchee National Forest continue to decline, [Rare Care's] rare plant monitoring program has played a vital role in continuing the monitoring necessary to provide critically needed information on the status of Washington State's rare plant species. . . . The scarcity of updated information on these plants puts them at risk of extirpation as a result of development, invasive species competition and other threats. All USFS Forest in Washington State have benefitted from this volunteer effort. . . ."





Top left, *Hackelia venusta* hardening off outdoors before outplanting (photo by Gail Roberts). Bottom left, *Hackelia venusta* (photo by Ellen Kuhlmann). Top right, *Saxifraga hyperborea* (photo by Brenda Cunningham). View photos in color under “Newsletters” at <http://depts.washington.edu/uwbg/rarecare/about.shtml>

## ***Hackelia* outplanting scheduled for November**

(continued from page 1) likely result from the wildfires that have occurred at the site and are also found in other forest soils in Washington.

She also looked for the presence of arbuscular mycorrhizal fungi (AMF), an association that would allow showy stickseed better access to soil nutrients. DNA was extracted from several root samples and from soil in the immediate vicinity of the plant roots to determine whether showy stickseed was colonized by AMF. The DNA testing results were inconclusive: AMF was present in the roots of a showy stickseed plant at a nearby introduction site but not in the roots of a plant collected at the native population.

The study also evaluated above-ground environment, including the composition of the overstory and understory, and availability of light. We found that showy stickseed occupied sites where only 20 to 37 percent of the ground was covered by herbaceous vegetation, with most of the ground either bare or covered with non-vascular species or woody debris. Its preferred microsites with low cover of shrub, grass, and non-vascular plants, but relatively higher forb cover. In other words, showy stickseed is occupying sites that other forbs also seem to prefer within this dynamic environment. It seems that its low competitive ability is what restricts it to these sites.

From these results, we surmise that the limited distribution of showy stickseed is due primarily to its ability to exploit the coarse, unstable soils at the sites that result in a low competitive environment. Interestingly, many members of the *Hackelia* genus are found on unstable soils and tend to divide their taproots as a strategy to survive in dynamic environments. Because of this, many species of *Hackelia* are patchily distributed on the landscape. In the case of showy stickseed, it is so rare because the combination of terrain, soil, aspect and vegetation cover that provides it suitable habitat appears to be limited to the immediate vicinity of the existing population.

Rare Care also continued work on improving propagation protocols for showy stickseed. Previous experiments yielded germination rates of 10 to 20%, a rate that is too low to develop a viable strategy for augmenting the population. Under this study, we were able to achieve germination rates of 85%, a vast improvement that allows us to produce adequate material for outplantings. We also evaluated several combinations of growth media and containers and we will be outplanting the plants produced from these experiments in November.

## **2016 Calendar**

**Sat. Mar. 5**—Rare Plant Monitoring Training, Seattle

**Sat. Apr. 2**—Navigation Training, Seattle

**Sat. Apr. 2**—Annual Volunteer Forum, Seattle

**Sat. May 21**—Rare Seed Collecting Training, Seattle (prerequisite: Rare Plant Monitoring Training)

**TBA**—Additional Volunteer Forums and Trainings, statewide

**TBA**—Annual Rare Plant Monitoring Weekend

**TBA**—Launch of new UW Botanic Gardens website, including rare plant image galleries and other new features

Information about volunteering and training may be found at [www.uwbotanicgardens.org/rarecare](http://www.uwbotanicgardens.org/rarecare)



## Surveys for gray cryptantha yield positive results

Rare Care staff and volunteers fanned out across sand dunes in central Washington this spring in search of gray cryptantha (*Cryptantha leucophaea*), a species that appears to be in decline (see the Spring 2015 *Rare Plant Press* newsletter for more information: <http://goo.gl/6ntEF4>). Over the past five years, Rare Care's volunteers have been unable to relocate a number of gray cryptantha's populations, causing concern among land managers about the status of this species. With funding from the Bureau of Land Management, Rare Care revisited 11 populations, including some of the historically largest populations, to see if the decline was occurring across all populations.

Multi-day surveys were carried out at Hanford Reach, Juniper Dunes, Potholes Reservoir, and Priest Rapids Dam vicinity. These areas hold the largest concentrations of sand deposits in the state, and large populations were historically reported from all of them. In addition, Rare Care staff and volunteers revisited several smaller populations to document their status, and several exploratory searches were completed in areas adjacent to known populations.

We found and documented three populations with over 1,000 individuals. The largest known population occurs at Hanford, where 6,300 plants were counted over three days. Staff from BLM, Washington Natural Heritage Program, and Mission Support Alliance's Ecological Monitoring and Compliance – Department of Energy's contractor for the Hanford Site – assisted with the effort. We only covered a small portion of the suitable habitat at Hanford; therefore, we estimate the populations to number tens of thousands.

A population of more than 2,400 individuals was discovered at Potholes in a new area to the north of a small population. It is the second largest known population of this species and is a significant discovery. Much of the sand dunes in the vicinity are covered with a crust of non-vascular plants so it will be important to watch this population in the future years to see how well gray cryptantha persists with this competition.

The other large population was documented on a mixture of public and private lands in the vicinity of Priest Rapids Dam. The population was estimated to be approximately 1,000 individuals.

Unfortunately, an intensive survey of Juniper Dunes failed to relocate a single plant, despite reports of it being abundant in the area prior to 1990. The area was visited the week following the surveys at the Hanford Reach, and yet appeared to be significantly drier and overrun with Mormon crickets. We speculated that there may be a localized multi-year drought occurring,

and recommend future visits once the area experiences consecutive years of average or above-average precipitation.

Rare Care volunteers also completed a number of visits to small populations to supplement the information gathered at the large sites. Similar to work done in previous years, they obtained mixed results for these sites. Three of the sites were not found, and the other four each held fewer than 100 plants and were smaller than populations sizes reported historically.

Combining this year's survey results with previous surveys in the past five years, Rare Care has now visited 35 of the 47 known occurrences of this species. Three contain populations of 1,000 or more individuals, five have between 100 and 500 individuals, 15 are smaller than 100 individuals, and 12 could not be relocated. Nineteen of the 23 populations we found appeared to be smaller than previous reports. While this is a worrying trend, we are relieved to know that there are at least three large populations with healthy, reproductive individuals that are spread out over a large portion of its range.

Right: Gray cryptantha sports white flowers with yellow centers May to June (photo by Barbara Varnum-Finney). Bottom right: The species favors sand dunes that aren't entirely stabilized (photo by David Zamora). Bottom left: Clustered stems bear narrow, elongate leaves (photo by Julie Bresnan).



## THANK YOU, DONORS: JULY 1, 2014 - JUNE 30, 2015

Rare Care is grateful for financial support provided by generous donors. We rely on grants and donations to fund all program activities. We are also grateful for the support of volunteers who contributed more than 3,500 hours of service.

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*Calochortus macrocarpus* var. *maculosus*  
(photo by Sarah Walker).

## Volunteers report new sites

(continued from page 1) And then there it was, a stone's throw away—one pygmy saxifrage—fairly safe from threats, just tricky to find in a rocky habitat riddled with crevices and overhangs.

This year volunteers found new sites of the endangered sagebrush mariposa-lily (*Calochortus macrocarpus* var. *maculosus*), the threatened Washington polemonium (*Polemonium pectinatum*) and the sensitive common bluecup (*Githopsis specularioides*). Wenatchee larkspur (*Delphinium viridescens*) wasn't spotted where it had been previously documented, but it was found nearby in two new sites—a result of searching a wider area and holding the image of the species in mind while approaching and departing the site.

Also this year, one of The Mountaineers instructors who provides navigation training to Rare Care volunteers each year asked if he could assist in monitoring! He teamed up with one of our volunteers to search some steep slopes on Orcas Island, and together they counted 51 arctic aster (*Eurybia merita*) that had not been found during a previous search in 2012.

Rare Care is grateful for support from the Miller Charitable Foundation, Seattle Garden Club, Tacoma Garden Club, Center for Plant Conservation, private organizations and individual donors.